The Utility of Anticipation

SOME TIME AGO, at a symposium on "Man and His Future,"* I referred to some of the awesome prospects of a new epoch of human evolution, the application of biological engineering to man. The most direct application of molecular biology—the specification of the genotype—was not preeminent in my concerns. Idealistically proposed eugenic measures like the encouragement of selected donors for artificial insemination (through preservation of interesting genotypes by sperm and tissue banks) may be justified if only for eventual research applications. However, their general application involves many contentious political problems, out of proportion to any practical effect that I can foresee for them within any relevant period of time. Overstress on these prospectives may have lulled many observers into a sense of nonchalance about any immediate impact of experimental genetic research on human affairs. Instead I would argue that the control of embryological and fetal development, e.g. of the human brain, is the most cogent point of leverage of biological engineering: that is, *euphenics* contra *eugenics.* Furthermore, technique for some mode of *vegetative reproduction,* like nuclear transplantation (as established in amphibia) or parthenogenesis (clearly established in turkeys) has to be established as a prerequisite of any likely approach to direct specification of the gene string. This would itself already open an uncharted new route for the further evolution of the species. I intend to discuss the detailed background and implications of these ideas at a later time. My present concern is with the value of *any* such discussion.

Such an exercise warrants critical attack on several grounds, with each of which I could be deeply sympathetic.

The prophecy may be palpably false. (Then the discussion can be a brief one if the assertions are well formed.)

The process of foresight may be inherently unscientific, however much it deals with scientific issues, since objective criteria of validity and verifiability are lacking. (This is almost the most discouraging bill of the indictment. But then, by these measures no policy can be strictly scientific; would this be grounds for discouraging rather than labelling scientists' nonscientific counsels? Murky as even the scientist's prophecies must often be, who can take his place in the responsible interpretation of the probable trajectory of scientific effort?) The process is also unscientific insofar as it confounds a pursuit of pure knowledge with human interests. (The grace of innocence became very elusive since Alamogordo twenty years ago.)

Finally, can any useful result flow from even the most rigorous anticipation of perplexing portents of future knowledge? (This can be the most influential restraint and is the main subject of this essay.)

My previous note revealed more uneasiness than clarity about constructive action. I advocated more stress in university teaching on human biology and man's future as an extrapolation of his past evolution—a rather weak proposal, but it remains my chief one. Does it meet the occasion?

The path from abstract idea to large scale social innovation is a tortuous one, uncertain in pace and direction even when the objectives are obviously and generally valued, and the way to them is plainly mapped. Political man is both conservative and capricious, and few scientists know how to impress him with their own wisdom. Many present evils contend for legislative attention. We then caution ourselves about attempting to create further distractions in this arena, at least not before the issues and their remedies have become plain and urgent. When they pass this threshold we then face the tactical perplexities of political activism.

Many examples arise to help answer this question. If we wait for the particular challenge, it will rarely arise as a well defined issue on which we can quickly mobilize well informed, temperate judgment. A world that had lacked timely indoctrination in the capabilities of nuclear power needed a terrible demonstration at Hiroshima as an urgent proof. The uncertainty whether a more general understanding of physics could have forfended the actual use of the bomb has dogged the conscience of scientists ever since. Even now, issues of capital punishment, of the legal sanction of abortion, the control of drugs and their testing and the uses of human organs are discussed in an atmosphere fogged by the accidents of particular cases. Even such questions as the protec-

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* Lederberg, J., Biological Future of Man, in Man and His Future, G. Wolstenholme, editor, Little, Brown & Co., Boston, 1963, p. 263.

The meeting was called to order by the President, Philip H. Reiswig, who with the help of the Counselor, Donald E. Griggs, presided over the initiation of new members. Inducted into membership were 13 seniors, one junior, three alumni, and one member of the faculty.

Since the entire School of Medicine will be at Loma Linda after July 1, 1966 an action was taken to the effect that the official office of the chapter be at Loma Linda rather than at Los Angeles, where it has been since the chapter was established in April 1957.

The Chairman introduced the charter members who were present. In addition to recognizing the absence of the only honorary member, Wilton L. Halverson, who died a few years ago, only two of the charter members were absent.

The Chairman introduced the speaker, Vernon L. Nickel, M.D., who is a member of the chapter. In a very interesting, stimulating and instructive presentation which was illustrated with slides, he pointed out problems related to the care of patients with chronic illnesses and in particular emphasized the necessity for the profession of medicine at large to improve the care of such patients. In that this area of patient care seems to have been neglected he pointed out that such improvement is possible and practicable.

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tion of the earth's atmosphere from chemical and radioactive pollution, or the protection of the planets from terrestrial contamination, become quickly entangled with political distractions totally irrelevant to the basic principles. Worse still, personal virtuosity and persuasiveness often confound a principled approach to policy, and the more so when hasty judgments are demanded on unfamiliar issues. Even the task of communicating basic information is obstructed by the embroil, once the issues become so tangled with the other actualities of the local scene.

The utility of anticipation is then the time it affords for a calm appreciation and wide debate of general principles. Abstract thinking is less defensible as a basis of law: we can perhaps wait for the realizations before we legislate. But we need to anticipate the future to have decided on our general approaches, and at least to know how to educate ourselves for responsibility.

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Book Reviews

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a health center where he functions primarily at a clinical level as he has few, if any, diagnostic aids. Alternately, he may work as an assistant in a hospital.

Throughout the text the authors repeatedly note the desperate need for preventive rather than curative medicine in these countries.

The last chapter, "Conclusions," comprises some 42 recommendations relevant to the Assistant Medical Officer. These, in essence, are the report. Included is a very comprehensive appendix which lists in detail educational requirements, the medical school syllabi with a detailed outline of course content and finally, examples of examination questions.

The authors, Dr. Edwin F. Rosinski, Professor of Medical Education and Director of the Office of Research in Medical Education, and Dr. Frederick J. Spencer, Professor and Chairman of the Department of Preventive Medicine, both at the Medical College of Virginia, have produced what must be considered a model of this type of study. As a narrative the book provides interesting reading; as a report it is clear and concise with well based recommendations which it is hoped will not go unheeded.